BVM-L / PVM-L Series

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BVM-L231 / BVM-L170
Professional Master Monitor

PVM-L3200 / PVM-L2300 / PVM-L1700
Professional Broadcast Monitor

TRIMASTER

Full Lineup of BVM-L and PVM-L Series High-Performance LCD Professional Monitors

High-performance BVM-L and PVM-L Series monitors are based on TRIMASTER technology, which itself is founded in Sony's world-leading CRT master monitor technologies developed for the broadcast and professional video production industries.

TRIMASTER technology is a design architecture that's unique to Sony. It achieves three elements essential for critical image monitoring: accurate color reproduction, precise images, and high-quality picture consistency. In developing monitors that exploit this technology, Sony's engineers scrutinized each and every basic specification one by one, and invested creativity without compromise into realizing the highest possible product performance.

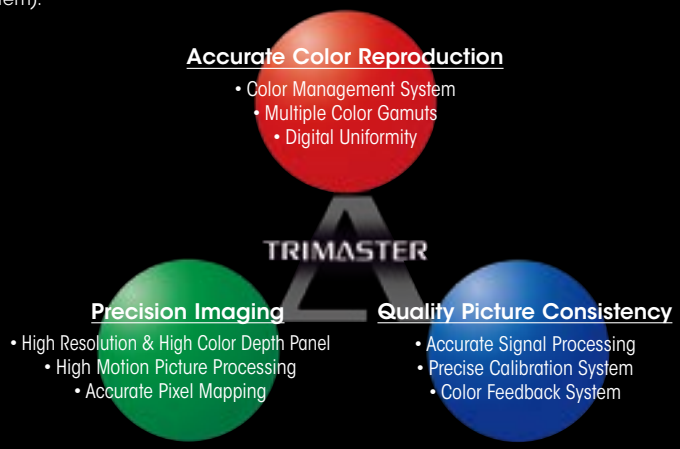
As a result of these extraordinary efforts, TRIMASTER high-performance monitors incorporate a 10-bit drive professional LCD panel, LED backlight system*, and 12-bit output accuracy display engine.

By combining these features with a sophisticated color management algorithm and advanced feedback systems, TRIMASTER monitors emulate color reproduction, image consistency, and image uniformity as accurately as – and often more accurately than – their CRT predecessors.

* The BVM-L Series employs a high-purity LED backlight system (the PVM-L Series employs a wide color gamut CCFL backlight system).

TRIMASTER Technology

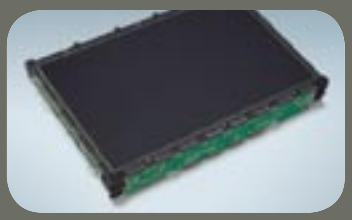
TRIMASTER technology is a design architecture used to bring out the full performance capabilities required for evaluation displays. It comprises the core technologies that enable the highest level of color accuracy, precision imaging, and picture-quality consistency.



Three Key Devices Enabling Master Monitor Picture Quality

■ Customized LCD Panel – 32-inch*, 23-inch*, and 17-inch* Full HD Resolution

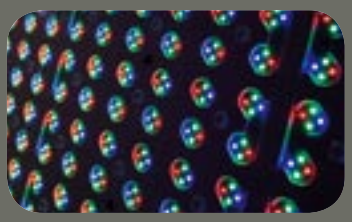
The LCD panels have been developed exclusively for use on the BVM-L and PVM-L Series, respectively, based on strict monitoring criteria. They offer a 10-bit driver and advanced LCD technology that can display high frame rates with a very high-speed response.



* 31.55-inch, 22.5-inch, and 16.52-inch viewable area measured diagonally, respectively.

■ Precision Backlight System

Using Sony-designed high-purity LEDs, the precision backlight system is another development used exclusively in the BVM-L Series* master monitors. This enables the widest color gamut ever offered in a Sony monitor and fully covers broadcast-standard color spaces. This precision backlight system also incorporates a uniformity control and a color feedback system.



* the PVM-L Series incorporates wide color gamut CCFL backlight system.

■ Professional Display Engine

The high-precision signal-processing engine has been developed to fulfill master monitor criteria and is optimized for use on the BVM-L Series and the PVM-L Series. This engine incorporates 12-bit output accuracy at each process, and provides a high-quality I/P conversion algorithm and a highly accurate color management system.

BVM-L Series

BVM-L231

BVM-L170

The BVM-L series monitors are reference monitors for critical evaluation in the broadcast and video production industries, and they are measuring instruments that strictly comply with the broadcast standards.

In designing these monitors, the overriding priority was to achieve the full performance capabilities required of master monitors. They therefore comprises the core technologies that enable the highest level of color accuracy, precision imaging, and picture quality consistency.

Development highlights include leading-edge key devices such as a 10-bit drive high-precision LCD panel, a 12-bit output accuracy display engine, and a high-purity LED backlight system that allows a wide color gamut and superb stability.

The hallmark of the BVM-L series is emulation of DCI color gamut* and film features and functions such as S-Log gamma, and 2048 image shift for 2K signal formats.

*The chromaticity of SMPTE RP 431-2-2007 is not covered in full.

PVM-L Series

PVM-L3200

PVM-L2300

PVM-L1700

The PVM-L Series is the cost-effective high performance monitor series that is optimized for broadcast and video production applications using the same technologies and many features as the BVM-L Series. As such, it is designed to support a wider range of broadcasting applications than master monitors.

The PVM-L series monitors are based on the same TRIMASTER technology as the BVM-L series , incorporating a 10-bit drive high-precision professional LCD panel, together with a 12-bit output accuracy display engine. With a Wide Color Gamut (WCG) CCFL in the backlight system, customized color filters, and Sony's unique color management system, the PVM-L series monitors cover the color gamut of the three broadcast standards. (SMPTE-C, EBU, and ITU-R BT709).

The choice of panel size - 32-inch*, 23-inch*, and 17-inch* — covers a broad range of applications and needs. For example, these monitors can replace CRT monitors in studios, editing suites, OB trucks, and in the fields.

*Viewable area measured diagonally.

Feature Comparison

	BVM-L Series	PVM-L Series
	BVM-L231 (23")*1 BVM-L170 (17")*1	**PVM-L3200 (32")*1 PVM-L2300 (23")*1 PVM-L1700 (17")*1**
Devices		
10-bit full HD resolution LCD panel	O	O
Backlight	High-purity LEDs	Wide color gamut CCFL
Inputs		
3G/HD/SD-SDI input (four option slots)	O	O
HDMI input	O	O
DVI-D input	O	O
Color gamut and Color temperature		
Color gamut	SMPTE-C, EBU, ITU-R BT.709, **D-Cine***2, BVM-L Native	SMPTE-C, EBU, ITU-R BT.709, PVM-L Native
Color temperature	D65, **D93, D61, D56, D-Cine,** User 1 to 5	D65, D93, User 1 to 5
General features and functions		
Black frame insertion	O **(Backlight blinking)**	O
Interlace display	O	O
Picture & picture	O (Side-by-side, **Wipe, Butterfly, Blending**)	O (Side-by-side only)
Pixel zoom	O	O
HD Frame capture	O	O
Black detail mode	O	O
Aspect correction mode	O	O
+12dB chroma up function	O	O
Marker settings	O	O
Aspect switch	16:9 ⇔ 4:3, **16:9 ⇔ 2.39:1, 1.896:1 ⇔ 2.39:1**	16:9 ⇔ 4:3
Scan switch	O	O
Native scan	O	O
Auto white balance	O	O
Auto Chroma / Phase adjustment	O	O
Internal test signal	O	O
Copy function	O	O
Ethernet-based remote control (BKM-16R)	O	O
EIA 19-inch Rack Mount (6U Height)	O (BVM-L170 only)	O (PVM-L1700 only)
DC operation	O (BVM-L170 only)	O (PVM-L1700 only)
Film features and functions		
Digital cinema 2K (2048 x 1080) formats	**O**	–
2048 Image slide	**O**	–
S-Log gamma	**O**	–
Gamut error display	**O**	–
Film cadence	**O**	–

*1 Viewable area measured diagonally: PVM-L3200: 31.55-inches (801.3 mm)
BVM-L231/PVM-L2300: 22.5-inches (570.6 mm)
BVM-L170/PVM-L1700: 16.52-inches (419 mm)

*2 The chromaticity of SMPTE RP 431-2-2007 is not completely displayed.

Main Features

The BVM-L and PVM-L Series incorporate TRIMASTER technologies. These have been customized for exclusive use in both BVM-L and PVM-L Series monitors, and provide the high reliability, accurate color reproduction, precision imaging, and picture-quality consistency required by today's most demanding high-performance and master monitoring applications.
Using these technologies, BVM-L and PVM-L Series monitors not only achieve the quality of their predecessors – BVM-A and BVM-D Series CRT monitors – but also add innovative features for today's new high-performance and master monitoring needs.

Superb Picture Quality and Stable Color Temperature

■ Accurate Color Reproduction

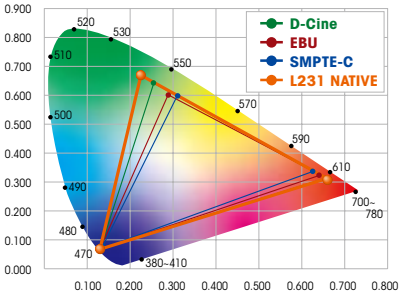
• Nonlinear Cubic Conversion Color Management System

The nonlinear cubic conversion color management system of BVM-L and PVM-L Series monitors uses a unique 3-D LUT (look-up table) to reproduce precise wide color gamuts meeting SMPTE and ITU standards, thus offering more accurate color reproduction. This system offers highly accurate tracking throughout the entire grayscale. The combination of this color management system with these monitors' high-performance backlight systems - a high-purity LED backlight in the BVM-L Series and Wide Color Gamut CCFL in the PVM-L Series - allows both types of monitor to accurately reproduce color gamuts that replicate broadcast standards such as ITU-R BT.709, and EBU and SMPTE-C phosphor standards.

In addition, BVM-L Series master monitors offer a unique "D-Cine*" gamut that reproduces the wider color space used for digital intermediate work.

Unlike earlier CRT monitors, that offer only one color gamut per model, the BVM-L and PVM-L Series allow these color gamuts to be selected and reproduced on the same monitor – a feature only made possible by these monitors' unique technologies.

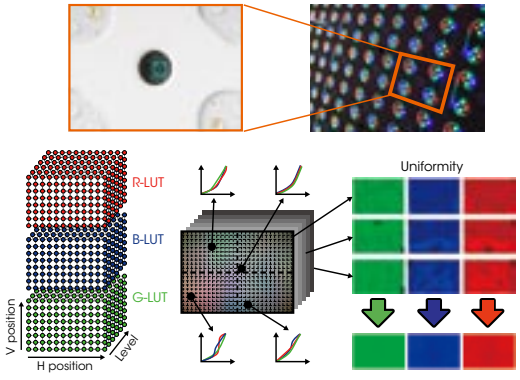
* "D-Cine" is a color gamut emulating the color gamut described in SMPTE RP 431-2-2007. The chromaticity of the green-red region is not covered in full, however, the color shift is subtle in this region.



■ Ultra-high Precision Uniformity Correction BVM-L Series

Historically, LCD monitors have a reputation for poor uniformity. The new BVM-L231 and BVM-L170 master monitors display superb brightness uniformity at every point of the screen, performance that is achieved by aligning the LED backlight located beneath the LCD panel. This is improved by two new and advanced technologies: precise adjustment of the LCD panel characteristics and a sophisticated LED backlight control system.

At the factory, grayscale levels are precisely measured in several key regions of the panel. Any differences detected in these regions are corrected using an RGB LUT (look-up table) adjustment system. This sophisticated LED backlight system then maintains the alignment using multiple optical RGB sensors aligned together with the R, G, and B backlight LEDs. These sensors continually monitor and control both the backlight luminance level and the color balance between the RGB LEDs. If color drift is detected, both the color feedback system and the light intensity system balance the corresponding LEDs – red, green, or blue in that specific region to maintain accurate luminance uniformity.
The combination of these two technologies allows BVM-L231 and BVM-L170 master monitors to provide the level of uniformity performance required for critical imaging.



■ Multiple Color Gamuts (SMPTE-C, EBU, ITU-R BT.709)

PVM-L Series

The PVM-L Series incorporates the same color conversion system as the BVM-L Series – the nonlinear cubic conversion color management system – that uses a unique 3-D LUT (Look-up table) to reproduce precise color gamuts throughout the entire grayscale. Also while wide color gamut CCFL backlights can in general reproduce wider color gamuts than conventional CCFL backlights, not all wide CCFLs are compatible with broadcast color gamuts. The WCG-CCFL backlight of the PVM-L Series is designed to emulate BVM-CRT color gamuts. And combined with its unique color management system, this enables the PVM-L Series to accurately reproduce color gamuts that emulate broadcast standards such as SMPTE-C, EBU, and ITU-R BT.709 phosphors standards. Unlike earlier CRT monitors, which offer only one color gamut per model, the PVM-L Series allows these color gamuts to be selected and reproduced on the same monitor – a feature made possible only by Sony's unique monitor technologies.

With the PVM-L Series, white can be reproduced uniformly right across the screen. At the factory, grayscale levels are precisely measured at each area of the panel and if differences are detected between areas, they are accurately corrected by electrical means.

■ Precision Imaging

• Full HD Panel with 10-bit Driver

The BVM-L and PVM-L Series both achieve a high resolution and stunning color depth using a full-HD 1920 x 1080* LCD panel and precise 10-bit driver.

* The BVM-L231 and PVM-L2300 incorporate a 1920 x 1200 pixel resolution panel.

• Exclusively Developed I/P Conversion Technology

The BVM-L and PVM-L Series use a sophisticated I/P conversion technique that keeps the artifacts typically seen in LCD monitors to a minimum, such as edge jaggedness, conversion errors, and picture delays of less than one field.

■ Picture-quality Consistency

• High-accuracy Display Engine

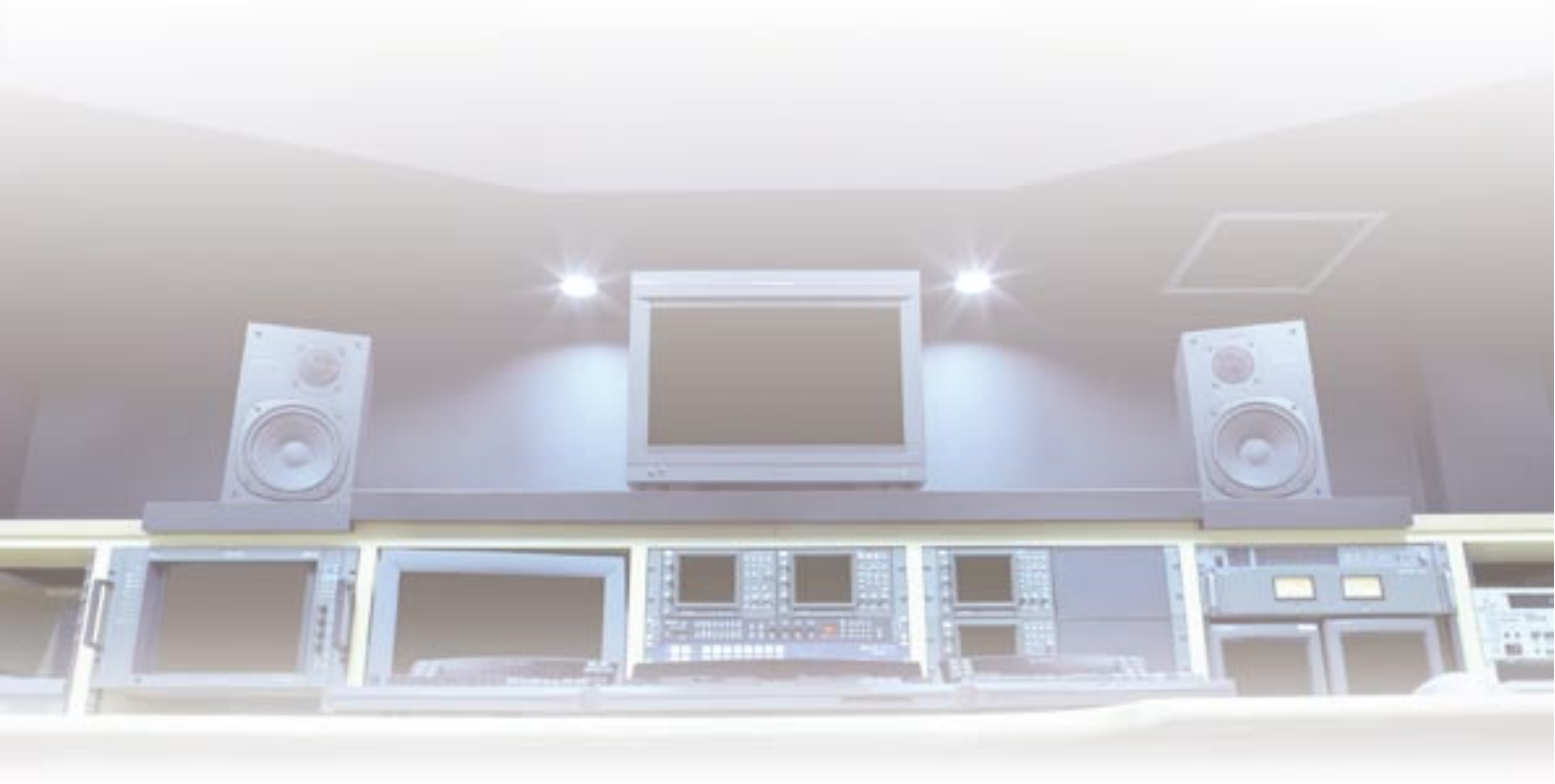
The BVM-L and PVM-L Series use a 12-bit display engine, which allows images to be reproduced with high precision for accurate evaluation and manipulation.

• Panel Calibration

Each and every BVM-L and PVM-L Series monitor is carefully calibrated at the factory on an individual basis, providing a high level of accuracy and stability for characteristics such as gamma and uniformity.

• Color Feedback System

Using a color feedback system, the BVM-L and PVM-L Series achieve the stability that's required for high-performance and master monitor applications.



Multi-format Signal Support

■ Input Versatility

Both BVM-L and PVM-L Series monitors can accept almost any SD or HD video format, both analog and digital, plus PC signals from VGA to WUXGA (1920 x 1200)*1.
In addition to a DVI-D and an HDMI™ interface equipped as standard, four option board slots are offered to configure these master monitors according to different user needs. The optional analog interfaces accept composite, Y/C, Y/Cb/Cr, and RGB.

Digital interfaces accept SD-SDI, HD-SDI, Dual-Link HD-SDI, and 3G-SDI inputs. Acceptable signal formats include:525/60i, 625/50i, 525/60p, 625/50p, 720/50p and 720/60P, 10-bit/12-bit RGB 4:4:4 1080/24PsF, 1080/24p, 1080/25PsF, 1080/25p, 1080/50i, 1080/30PsF, 1080/30P and 1080/60i, 10-bit 4:2:2 1080/50p and 1080/60p, and the digital cinema formats of 12-bit 4:4:4 RGB/XYZ 2048 x 1080/24PsF and 2048 x 1080/24p*2.

*1 BVM-L170, PVM-L3200, and PVM-L1700 monitors can accept PC signals up to full HD (1920 x 1080).

*2 The BVM-L Series only accepts 2048 digital cinema signal formats.

BVM-L231 with the optional BKM-250TG 3G-SDI board

● 3G-SDI Interface

Both the BVM-L and PVM-L Series can be equipped with an optional 3G-SDI interface. The BKM-250TG 3G-SDI interface board is compliant with the SMPTE 425 standard and requires only one single SDI cable to transmit up to 10-bit 4:2:2 1080/p video signals.

This optional 3G-SDI interface offers a simple cabling solution for groups of video equipment rack-mounted behind an editing room and a sub-control room.

BVM-L and PVM-L Series Acceptable Signal Formats

NO	System Nomenclature	Samples per active line	Active lines per frame	Frame Rate fV (Hz)	Interface sampling freq (MHz)	Samples per active line	Total lines per frame	Line Frequency fH (kHz)	Standard
1	525/59.94i	720	487	59.94	13.5	858	525	15.73	Rec.ITU-R BT.601
2	625/50i	720	576	50	13.5	864	625	15.63	Rec.ITU-R BT.601
3	525/59.94p	720	483	59.94	27	858	525	31.47	SMPTE 293M/Rec.ITU-R BT.1358
4	625/50p	720	576	50	27	864	625	31.25	Rec.ITU-R BT.1358
5	1920 x 1080/24PsF*1	1920	1080	48/47.95	74.25 74.25/1.001	2750 2750	1125	27.00	SMPTE RP 211
6	1920 x 1080/24p*1	1920	1080	24/23.97	74.25 74.25/1.001	2750	1125	27.00	SMPTE 274M
7	1920 x 1080/25PsF	1920	1080	50			1125	28.13	RP 211
8	1920 x 1080/25p	1920	1080	25	74.25	2640	1125	28.13	SMPTE 274M
9	1920 x 1080/50i	1920	1080	50	74.25	2640	1125	28.13	SMPTE 274M
10	1920 x 1080/30PsF*1	1920	1080	60/59.94			1125	33.75	RP 211
11	1920 x 1080/30p*1	1920	1080	30/29.97	74.25 74.25/1.001	2200	1125	33.75	SMPTE 274M
12	1920 x 1080/60i*1	1920	1080	6/59.94	74.25 74.250/1.001	2200 2200	1125	33.75	SMPTE 274M
13	1280 x 720/24p*1	1280	720	24/23.97	74.25 74.25/1.001	4125	750	18.00	SMPTE 296M
14	1280 x 720/25p	1280	720	25	74.25	3960	750	18.75	SMPTE 296M
15	1280 x 720/30p*1	1280	720	30/29.97	74.25 74.25/1.001	3300	750	22.50	SMPTE 296M
16	1280 x 720/50p	1280	720	50	74.25	1980	750	37.50	SMPTE 296M
17	1280 x 720/60p*1	1280	720	60/59.94	74.25 74.250/1.001	1650 1650	750	45.00	SMPTE 296M
18	1920 x 1080/50p	1920	1080	50	148.5	2640	1125	56.25	SMPTE 274M
19	1920 x 1080/60p*1	1920	1080	60/59.94	148.5 148.5/1.001	2200	1125	67.50	SMPTE 274M
20	2048 x 1080/24PsF*1*2	2048	1080	48/47.95	74.25 74.25/1.001	2750	1125	27.00	
21	2048 x 1080/24p*1*2	2048	1080	24/23.97	74.25 74.25/1.001	2750	1125	27.00	

*1 Also compatible with 1/1.001 frame rates.

*2 BVM-L Series only supports 2048 digital cinema signal formats.

■ Flexible Input Configuration

Like BVM-A Series CRT monitors, BVM-L and PVM-L Series monitors use a modular slot design so inputs can be configured according to individual needs. Four input board slots are available. Optional input boards* can be installed in any board slot, and in almost any combination, allowing easier configuration and better cost-per-input value. These option boards utilize only one slot each, so up to four cards can be installed for maximum flexibility.

* BVM-L and PVM-L Series input boards are not compatible with other earlier BVM-A or BVM-D Series CRT monitors.

Input Board Slots

Interface Chart by Input Boards

Input Signal \ Board	System Nomenclature	Signal Format	BKM-220D	BKM-227W	BKM-229X	BKM-243HS*3	BKM-244CC*3	BKM-250TG*3
Analog Input	525/59.94i	Composite, Y/C (NTSC/PAL/PAL-M/SECAM)		●				
	625/50i			●				
	525/59.94i	Y/PB/PR, RGB		●				
	625/50i			●				
	1080/24Psf*2				●			
	1080/24p*2				●			
	1080/50i (25PsF)				●			
	1080/25p				●			
	625/50p				●			
	525/59.94p				●			
	1080/60i (30PsF)*2				●			
	1080/30p*2				●			
	720/50p				●			
	720/60p*2				●			
SD-SDI	525/59.94i	Y/PB/PR	●			●	●	●
	625/50i		●			●	●	●
HD-SDI	1080/24PsF*2	10bit 4:2:2 Y/PB/PR				●	●	●
	1080/25PsF					●	●	●
	1080/30PsF*2					●	●	●
	1080/50i					●	●	●
	1080/60i*2					●	●	●
	1280 x 720/60p*2					●	●	●
	1280 x 720/50p					●	●	●
Dual-Link HD-SDI	1080/24PsF*2	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/24p*2					●*1	●*1	●*1
	1080/25PsF	10bit 4:4:4 Y/PB/PR, RGB				●*1	●*1	●*1
	1080/25p	12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/30PsF*2	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/30p*2	12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/50i	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/60i*2					●*1	●*1	●*1
	1080/50p	10bit 4:2:2 Y/PB/PR				●*1	●*1	●*1
	1080/60p*2	10bit 4:2:2 Y/PB/PR				●*1	●*1	●*1
	2048 x 1080/24PsF*2 *5	12bit 4:4:4 XYZ 10bit/12bit 4:4:4 RGB				●*1	●*1	●*1
	2048 x 1080/24p*2 *5					●*1	●*1	●*1
3G-SDI	1080/24PsF*2 *4	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 Y/PB/PR, RGB						●
	1080/25PsF*4							●
	1080/30PsF*2 *4							●
	1080/24p*2 *4							●
	1080/25p*4							●
	1080/30p*2 *4							●
	1080/50i*4							●
	1080/60i*4							●
	1080/50p	10bit 4:2:2 Y/PB/PR						●
	1080/60p*2							●
	1280 x 720/24p*2 *4	10bit 4:4:4 Y/PB/PR, RGB						●
	1280 x 720/25p*4							●
	1280 x 720/30p*2 *4							●
	1280 x 720/50p*4							●
	1280 x 720/60p*2 *4							●
	2048 x 1080/24PsF*2 *4 *5	10bit 4:4:4 RGB						●
	2048 x 1080/24p*2 *4 *5	12bit 4:4:4 RGB, XYZ						●
Number of digital inputs			2	–	–	2	2	2
Number of analog inputs			–	1	1	–	–	–

*1 Two BKM-243HS or BKM-244CC, or one BKM-250TG optional boards are used. *2 Also compatible with 1/1.001 frame rates. *3 BKM-243HS, BKM-244CC and BKM-250TG automatically detect SD-SDI and HD-SDI input signals. *4 Untested *5 BVM-L Series only supports 2048 digital cinema signal formats.

HDMI/DVI-D Input Signal Formats

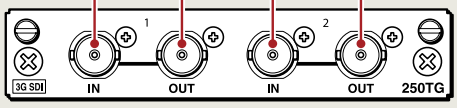
System	Interface sampling freq (MHz)	Aspect Ratio	Standard	HDMI RGB 4:4:4 8/10/12 bit YCbCr 4:4:4 8/10/12 bit YCbCr 4:2:2 12 bit	DVI-D Single Link RGB 4:4:4 8 bit
Viedo Signals					
640 x 480/60p*	25.200*	4:3	CEA-861	○	○
720 x 480/60p*	27.027*	4:3/16:9		○	○
1280 x 720/60p*	74.250*	16:9		○	○
1920 x 1080/60i*	74.250*	16:9	CEA-861	○	○
		2.39:1			
720 (1440) x 480/60i*	27.027*	4:3/16:9	CEA-861	○	○
720 x 576/50p	27.000*	4:3/16:9		○	○
1280 x 720/50p	74.250	16:9		○	○
1920 x 1080/50i	74.250	16:9	CEA-861	○	○
		2.39:1			
720 (1440) x 576/50i	27.000	4:3/16:9	CEA-861	○	○
1920 x 1080/60p*	148.500*	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/50p	148.500	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/24p*	74.250*	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/25p	74.250	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/30p*	74.250*	16:9	CEA-861	○	○
		2.39:1			
Computer Signals					
800 x 600/60p	40.000	4:3	VESA	○	
1024 x 768/60p	65.000	4:3		○	
1280 x 960/60p	108.000	4:3		○	
1280 x 1024/60p	108.000	5:4		○	
1400 x 1050/60p	121.750	4:3		○	
fH:28-75 kHz, fV:48-85 Hz Max. res.: 1920 x 1080/60p	25.000-162.000				○

* Also compatible with 1/1.001 frame rates.

■ Signal-interface Options

BKM-250TG, 3G/HD/SD-SDI Input Adaptor*

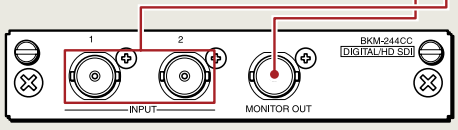
- 3G/HD/SD-SDI signal input (x2)
- 3G/HD/SD-SDI monitor output (x2)



* 3G-SDI, HD-SDI and SD-SDI signals are detected automatically

BKM-244CC, HD/SD-SDI Closed Caption Adaptor*

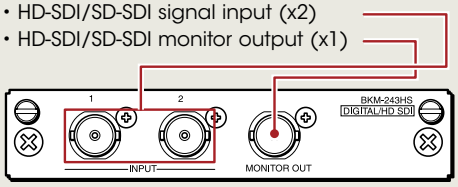
- HD-SDI/SD-SDI signal input (x2)
- HD-SDI/SD-SDI monitor output (x1)



* HD-SDI and SD-SDI signals are detected automatically
* Closed-caption decoders (EIA 608 and EIA 708) are equipped

BKM-243HS, HD-SDI/SD-SDI Input Adaptor*

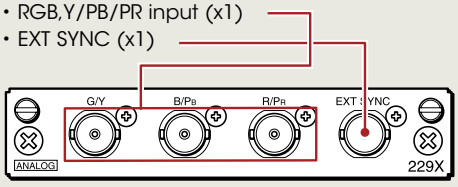
- HD-SDI/SD-SDI signal input (x2)
- HD-SDI/SD-SDI monitor output (x1)



* HD-SDI and SD-SDI signals are detected automatically

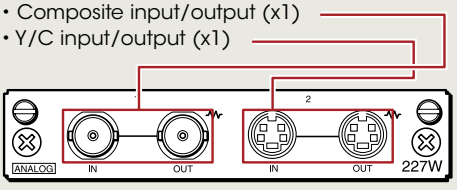
BKM-229X, Analog Component Adaptor

- RGB,Y/PB/PR input (x1)
- EXT SYNC (x1)



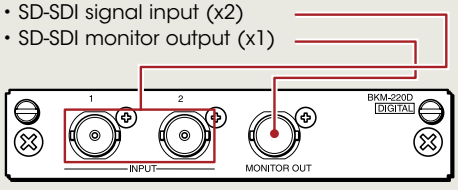
BKM-227W, NTSC/PAL Input Adaptor

- Composite input/output (x1)
- Y/C input/output (x1)



BKM-220D, SD-SDI 4:2:2 Input Adaptor

- SD-SDI signal input (x2)
- SD-SDI monitor output (x1)



Operational Convenience

BVM-L and PVM-L Series monitors have unique features which are made possible only by Sony's flat-panel technologies. These monitors also benefit from the same acclaimed functions and operational conveniences of their predecessors, BVM-A Series and BVM-D Series CRT master monitors.
In addition, the BVM-L170 and PVM-L1700 incorporate a robust protection panel and a DC battery-operation capability, features which are extremely desirable in the field.

Variety of Display Modes

Most flat-panel monitors can only display progressive images at the input signal's frame rate. However, the BVM-L and PVM-L Series have two additional and unique display modes – Black Frame Insertion Display and Interlace Display:

■ Black Frame Insertion Display

Combining its high-frame-rate operation*1 with unique Black Frame Insertion technology, BVM-L and PVM-L Series master monitors dramatically reduce motion blur; a characteristic that is inherent to LCD devices. As for the BVM-L231 and BVM-L170, these monitors employ Black Frame Insertion using a method called backlight blinking. Sony's backlight blinking operates by turning the backlight emission on and off within the duration of one frame*2. This newly developed method minimizes black level rise in dark portions of the image.

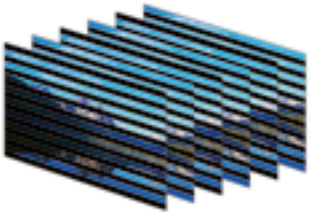
*1 Supports 120-Hz and 100-Hz frame rates.

*2 This is not a dynamic backlight system where the light level varies according to the average picture level.

100/120Hz
Black Frame
Insertion Display

■ Interlace Display

In Interlace Display mode, the BVM-L and PVM-L Series can display interlace input signals as interlace fields. As with the Native Scan function, Interlace Display mode offers faithful reproduction of the input signal and the displayed interlace fields are free from the picture degradation that can occur as a result of the monitor's I/P conversion process.



100/120Hz
Interlace Display

Native Scan (pixel-to-pixel display)

Conventional flat-panel monitors reproduce images using scaling and I/P conversion due to their fixed pixel counts and progressive scanning processes. Native Scan function is a unique display mode that reproduces images without changing the input signal's pixel count. For example, when an SD signal is input, BVM-L and PVM-L Series monitors will reproduce the image at a picture size of 720 x 487* pixels. For SD input in particular, Native Scan function also allows the image's display size to be doubled to 1440 x 974* by duplicating and doubling each pixel both horizontally and vertically.

* The 525/59.94i signal specified by Rec. ITU-R BT.601

1920 x 1080 Native Scan

720 x 487 Native Scan

1440 x 974 Native Scan
(720 x 487) x 2

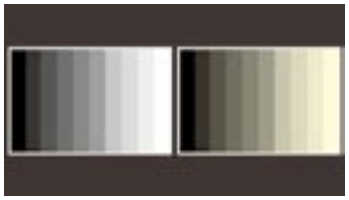
Picture & Picture

The unique Picture & Picture function of the BVM-L and PVM-L Series allows simultaneous display of two input signals on the monitors' LCD screen. This function is extremely convenient for making instant adjustments to two input sources, because there is no need to individually adjust the different characteristics of two monitors.

This function comes in handy for adjustments between two cameras, special-effects creation, time-lapse shooting, and computer-generated graphics work. The BVM-L Series offers four Picture & Picture modes, while the PVM-L Series offers one mode:

■ Side by Side

The two picture images are downscaled using a digital filter and displayed side by side. This feature is convenient when making white balance adjustments or determining shooting angles between two cameras.



■ WIPE BVM-L only

The area of the two pictures to be displayed is selected using a vertical WIPE pattern, which is controlled from the BKM-16R. This function is useful when picture detail of the two images must be examined on a pixel basis. This is normally used to review still images.

■ Butterfly BVM-L only

The two inputs are displayed as line-symmetric images on the left and right halves of the screen. By adjusting the H-position controller, the two images can be moved inward to the middle of the screen. An instant comparison of the moving images can then be made easily and accurately, without the user having to move their eyes.

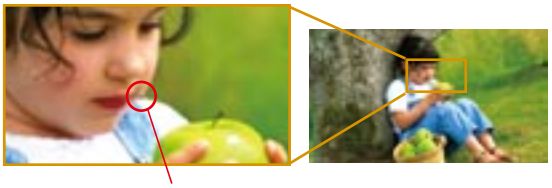
■ Blending BVM-L only

The two picture images are overlapped for display, and the mix ratio is adjustable. This function is useful to verify whether a foreground signal is accurately keyed into the background signal, or when combining shoots with live action and computer-generated effects.

Pixel Zoom

Pixel Zoom is a function for magnifying images. A selected area of the displayed picture can be enlarged on a pixel basis, up to eight times in size both vertically and horizontally. Because this function does not use scaling, the desired picture content is magnified and displayed faithfully to the raw input signal. This function is useful when evaluating precise picture edges, such as for chroma keying.

* This function is effective when the input signal is displayed in "Native Scan" mode.



HD Frame Capture

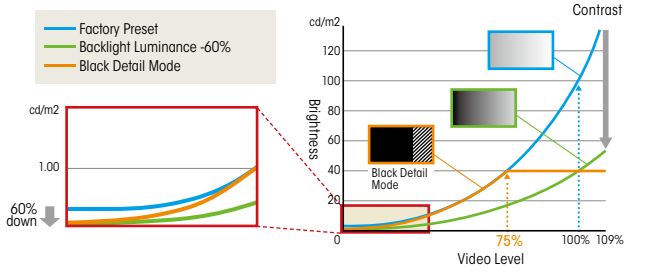
The HD Frame Capture function of the BVM-L and PVM-L Series allows a picture frame from the HD-SDI input to be captured and saved as a picture file on Memory Stick™ media*. This picture file can be used as a reference for various purposes; for example, as for picture-tone adjustments between past images and for camera-framing adjustments.

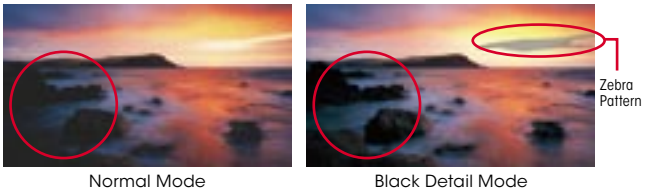
* Both standard-size Memory Stick™ media and smaller Memory Stick Duo™/ Memory Stick PRO Duo™ media can be used. A Memory Stick Duo adaptor is not required.

Black Detail Mode

Due to the mechanism of an LCD panel, backlight leakage from the panel surface is unavoidable. Black Detail mode provides more accurate monitoring of black detail in dark, low-APL images. Utilizing a sophisticated backlight system and a unique signal-processing algorithm in the BVM-L and PVM-L Series, the black region of the video level is effectively enhanced*. This mode is recommended as an auxiliary function.

* Video levels higher than 75% are clipped for display. In this mode, the clipped areas can be indicated with a zebra pattern.

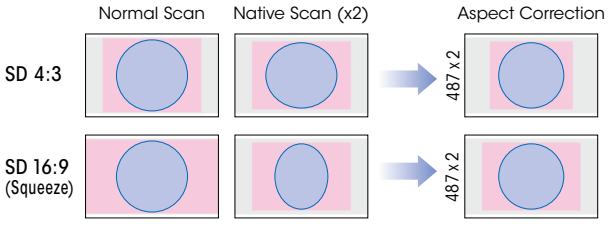




Normal Mode | Black Detail Mode

Aspect Correction Mode

A major difference between CRT and LCD monitors is the shape of their respective pixel arrays. CRT monitors use a non-square array, while LCD displays adopt a square-shaped array. Aspect Correction mode is a technique used by LCD displays including the BVM-L and PVM-L Series to overcome this difference and emulate the look of a CRT image. Using a scaling technique, this function arranges the SD input signal to emulate a CRT's non-square pixel array in a horizontal direction. It also applies the appropriate scaling algorithm depending on the video format, NTSC or PAL. An interlace display mode can also be applied when necessary, enabling the monitor to reproduce familiar-looking SD images.



Example of NTSC signal on the 16:10 aspect panel - BVM-L231

Gamut Error Display

BVM-L only

BVM-L231and BVM-L170 master monitors incorporate a Gamut Error Display function that detects irregular signal input. When an irregular signal is detected, BVM-L231 and BVM-L170 master monitors indicate this with a zebra pattern over the relevant area of the picture. Irregular signal data can include non-standard input signals and video signals exceeding the video level (selectable); these are generated during signal conversion from HD component to RGB. Gamut Error Display is a convenient feature that instantly alerts viewers to such signals without requiring the use of a waveform monitor.

S-LOG Gamma

BVM-L only

BVM-L231 and BVM-L170 master monitors incorporate gamma tables to reproduce images captured using S-LOG Gamma technology. S-LOG gamma is a technique used in Sony's digital cinematography cameras that allows the full latitude of the camera CCD to be maintained throughout the production chain. Unlike conventional systems, in which highlight contrast is compressed, S-LOG Gamma logarithmically converts the video signal using characteristics similar to film negatives. This keeps the camera CCD dynamic range intact, even in extreme highlight areas. Both the BVM-L231 and BVM-L170 allow reproduction as an inverse function of the camera's S-LOG gamma signals. Two display modes are offered:

1) S-LOG Full

This mode displays the full dynamic range of the video signal captured from Sony's digital cinematography cameras.

2) S-LOG Standard

This mode displays image exposure levels at the lower part of the S-LOG gamma signal dynamic range, allowing image areas of regular brightness to be viewed clearly. Higher exposure levels are clipped in this mode.

2048 Image Slide

BVM-L only

The 2048 Image Slide function of the BVM-L231 and BVM-L170 allows 2K*1 resolution images to be mapped, pixel-to-pixel, on the 1920*2 full-HD panel without picture degradation. When the user needs to view the left or right edge of the picture frame, they can scroll the image in a horizontal direction.

*1 2048 x 1080 pixels

*2 1920 x 1080 pixels

"+12dB Chroma UP" Function

A "Chroma UP" button located on the front panel of the BKM-16R allows the chroma level to be boosted by +12 dB. This is a convenient feature for adjusting camera white balance with a higher degree of accuracy.

Marker Settings

Like the earlier BVM Series CRT monitors, BVM-L and PVM-L Series monitors can display various markers, including an aspect marker, safe area marker, and center marker. In addition to this flexible selection of marker types, detailed display settings of each marker are offered. For example, the color, brightness, horizontal/vertical position, and width of aspect markers can all be controlled, while the height and width of safe area markers can be adjusted. What's more, users can also choose to display two safe area markers, each selectable between three marker variations. These flexible marker controls, together with the choice of many different marker types such as aspect marker types (lines or aspect blanking) and center marker types (long or short), make BVM-L and PVM-L Series monitors the perfect all-round display device for a variety of shooting scenarios – from SD/HD video acquisition to digital cinematography*.

* PVM-L Series monitors support only 16:9 and 4:3 aspect markers.

Marker Variation

	Safe Area Marker		Aspect Marker*
	%	Dot (Pixel)	
Selectable Markers	80%, 88%, 90%, 93%, or variable	Flexible	16:9, 15:9, 14:9, 13:9, 4:3, 2.39:1, 2.35:1, 1.896:1. 1.85:1, or 1.66:1
Line Colors	White, Red, Green, Blue, Yellow, Cyan, or Magenta		
Line Width	Thick or Thin		
Line Luminance	90 IRE or 40 IRE		

* The PVM-L Series supports 16:9 and 4:3 only

Scan Switch

The Scan Switch function allows switching between 5% blanking (or 95% area display), and 0% and -3% Under Scan mode.

DC Battery Operation

The BVM-L170 and PVM-L1700 can be either AC or DC battery operated. Due to their lightweight and small-size design, with a comparable height to the former 14-inch BVM-CRT monitors, the BVM-L170 and PVM-L1700 are ideal for field and OB van applications.

Marker Examples

Screen Size: 16:9,
Aspect Mode: 2.35:1*,
Aspect Marker Color:Magenta,
Marker Bright: 90IRE,
Width: THICK,
Safe Area: Shape A,
Area Size: 80%,
Center Marker: Short,
Aspect Blanking: Off

*BVM-L Series only support 2.35:1 aspect.

Screen Size: 16:9,
Aspect Mode: 14:9*,
Aspect Marker Color: Yellow,
Marker Bright: 40IRE,
Width: THIN,
Safe Area: Shape B,
Area Size 80%,
Center Marker: Short,
Aspect Blanking: HALF

*BVM-L Series only support 14:9 aspect.

Screen Size: 16:9,
Aspect Mode: 4:3,
Aspect Marker Color: Green,
Marker Bright: 90IRE,
Width: THICK,
Safe Area: SHAPE C,
Area Size: 80%,
Center Marker: LONG, Aspect Blanking: BLACK

Robust Protection Panel

The BVM-L170 and PVM-L1700 incorporate a robust protection panel as standard. For the BVM-L231 and PVM-L2300, the optional BKM-23M Protection Panel is recommended, and this is easy to attach and detach.

The BVM-L231 with
the optional BKM-23M Protection Panel
The BKM-23M can also be attached to the PVM-L2300.

Modular Monitor Control Unit (BKM-16R)

Like earlier BVM Series CRT monitors, these monitors and their control panels are provided as separate units, allowing greater flexibility for system integration. The BVM-L and PVM-L Series incorporate a monitor control unit, the BKM-16R. With BVM-L231, BVM-L170, PVM-L2300, and PVM-L1700 monitors, this unit can be attached beneath the monitor using the optional controller attachment stand*, or connected remotely via an Ethernet cable.

* The BVM-L231 uses the BKM-37H Attachment Stand.

* The PVM-L2300 uses either the BKM-37H or BKM-38H Attachment Stand.
The BVM-L170 and PVM-L1700 use the BKM-39H Attachment Stand.

The BVM-170 monitor and the BKM-16R controller attached with the BKM-39H Attachment Stand.

The BVM-L231 monitor and the BKM-16R controller attached with the BKM-37H Attachment Stand.

Ethernet-based Remote Control

Like BVM-A Series monitors and controller, the BVM-L and PVM-L Series monitors and the BKM-16R Monitor Control Unit are equipped with an Ethernet port, allowing remote control of display parameters across a standard Ethernet connection. One BKM-16R Monitor Control Unit can control up to thirty-two (32) BVM* monitors.

* Includes BVM-A CRT monitors and BVM-L and PVM-L LCD monitors.

Copy Function

The optional BKM-16R control unit has a Memory Stick™ slot*1 to save and load monitor setup and adjustment data. This is useful for multiple monitor systems, allowing the same setup and adjustment data to be loaded onto each unit*2. This data can also be transferred via the BVM's Ethernet connection.

*1 Both standard-size Memory Stick media and the smaller Memory Stick Duo Memory Stick PRO Duo media can be used. A Memory Stick Duo adaptor is not required.

*2 Data can be moved between BVM-A, BVM-L, and PVM-L monitors.

BKM-16R Monitor Control Unit

Front Panel

Rear Panel

Easy Setup and Adjustment

Auto White Balance

The color temperature and white balance of BVM-L and PVM-L Series monitors can be automatically adjusted by the Auto White Balance function using specified color temperature probes*, such as the Konica Minolta CA-210, DK-Technologies PM5639/06, and X-Rite i1 (Eye-One) Pro.

* A connector is required for each color analyzer.

Auto Chroma/Phase Adjustment*

An Auto Chroma/Phase/Matrix setup function is provided on BVM-L and PVM-L Series monitors, which automatically adjusts the monitor's chroma, phase, and matrix using external color bars.

* Supports analog signal inputs only.

Internal Test Signal and SMPTE Color Bars

BVM-L and PVM-L Series monitors incorporate a built-in test signal generator for: 100% white signal, 20% gray signal, 0% black signal, PLUGE (Picture Line Up Generating Equipment) signal, color bar signals, 5-step grayscale signal, and ramp signal.

"Character Off" Button (BKM-16R)

To facilitate parameter adjustments, the On-Screen Menu indication can be taken off the screen, while in Menu mode. The On-Screen Menu indication can be toggled on or off with a simple press of a button on the BKM-16R's front panel.

Color Temperature Selection

With BVM-L Series monitors*1, the color temperature can be selected from D65, D93, D61, D56, D-Cine*2, or User1 to User5. A "Color Temp" (color temperature) button located on the BKM-16R's front panel enables instant access to the "Color Temp menu" without using the On-Screen menu.

*1 The PVM-L Series supports color temperatures of D65, D93, and User1 to User5.

*2 D-Cine: x=0.314, y=0.351

Aspect Switch

The aspect ratio can be switched between 4:3, 16:9, 2.39: 1*, and 1.896:1* depending on the input signal.

16:9	⇔ 4:3
16:9	⇔ 2.39:1*
1.896:1	⇔ 2.39:1*

* BVM-L Series only.

* Aspect ratios of 2.39:1 and 1.896:1 are supported by the BVM-L Series only.

Other Features

- VESA™ Mounting (200 x 100 mm pitch)*1
- 19-inch EIA Standard Rack Mountable*2
- Blue Only
- Mono
- H Delay/V Delay
- NTSC Setup Level (0%, 7.5%)
- Component Level (SMPTE/EBU-N10 or Betacam)
- Aperture
- Serial Remote (Ethernet)
- Parallel Remote (D-sub 9-pin)
- Tally Lamp (Amber)
- EXT Sync (for RGB/YUV)
- Remote Maintenance

*1 BVM-L231, PVM-L3200, and PVM-L2300 only

*2 BVM-L170 and PVM-L1700 only

The BVM-L231 with the BKM-37H Attachment Stand

Specifications

		BVM-L231	BVM-L170
PICTURE PERFORMANCE			
Type		a-Si TFT Active Matrix LCD	a-Si TFT Active Matrix LCD
Picture Size (Viewable Area)	(H x V)	Approx. 483.8 x 302.4 mm (Approx. 19 1/8 x 12 inches)	Approx. 366 x 206 mm (Approx. 14 1/2 x 8 1/8 inches)
	(Diagonal)	570.6 mm (22 1/2 inches)	Approx. 419 mm (16 1/2 inches)
Aspect		16:10	16:9
Resolution (H x V)		1920 x 1200 pixels (WUXGA)	1920 x 1080 pixels
Pixel Efficiency		99.99 %	99.99 %
Backlight		High-purity LEDs	High-purity LEDs
Preset Brightness		100 cd/m² (D-Cine: 48 cd/m²) (when 100 % white signal is input)	100 cd/m² (D-Cine: 48 cd/m²) (when 100 % white signal is input)
Panel drive		RGB 10 bit	RGB 10 bit
Panel frame rate		96/100/120 Hz	96/100/120 Hz
Viewing angle		85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)
INPUT/OUTPUT			
Video Input/Output		Four (4) slots	Four (4) slots
PC Input		DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)
HDMI		HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)
Control	LAN	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)
	Parallel Remote	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)
	Option A	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)
	Option B	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)
DC 5V Out		Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)
GENERAL			
Power Requirements		100 V to 240 V AC, 2.0 to 0.9 A, 50/60 Hz	100 V to 240 V AC, 1.5 A to 0.7 A, 50/60 Hz, or DC 24V to 28V, 5.4 A to 4.6 A
Power consumption		Approx. 180 W (at maximum load, the luminance compensation due to the aged deterioration of the LED is included.)	Approx. 130 W (AC), Approx. 120 W (DC) (at maximum load, the luminance compensation due to the aged deterioration of the LED is included.)
Operating Temperature		0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity		0 % to 90 % (no condensation)	0 % to 90 % (no condensation)
Operating Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa
Storage and Trans. Temperature		-20 °C to +60 °C (-4 °F to +140 °F)	-20 °C to +60 °C (-4 °F to +140 °F)
Storage and Trans. Humidity		0 % to 90 %	0 % to 90 %
Storage and Trans. Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa
Dimensions (W x H x D)		565.5 x 436.4 x 243.1 mm (22 3/8 x 17 1/4 x 9 5/8 inches)	436 x 265.8 x 278.6 mm (17 1/4 x 10 1/2 x 11 inches)
Mass		Approx. 21 kg (46 lb 5 oz)	Approx. 14 kg (30 lb 14 oz)
Supplied Accessories		AC power cord (1), AC plug holder (1), Cable holder (1), Bracket (1), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Rack mount bracket (Left, right, each 1), Rack mount attachment screws (6), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)

		PVM-L3200	PVM-L2300	PVM-L1700
PICTURE PERFORMANCE				
Type		a-Si TFT Active Matrix LCD	a-Si TFT Active Matrix LCD	a-Si TFT Active Matrix LCD
Picture Size (Viewable Area)	(H x V)	698.4 x 392.85 mm (27 1/2 x 15 1/2 inches)	483.8 x 302.4 mm (19 1/8 x 12 inches)	365.8 x 205.7 mm (14 1/2 x 8 1/8 inches)
	(Diagonal)	801.3 mm (31 5/8 inches)	570.6 mm (22 1/2 inches)	419 mm (16 1/2 inches)
Aspect		16:9	16:10	16:9
Resolution (H x V)		1920 x 1080 pixels	1920 x 1200 pixels (WUXGA)	1920 x 1080 pixels
Pixel Efficiency		99.99%	99.99%	99.99%
Backlight		Wide Color Gamut CCFL	Wide Color Gamut CCFL	Wide Color Gamut CCFL
Preset Brightness		100 cd/m² (when 100 % white signal is input)	100 cd/m² (when 100 % white signal is input)	100 cd/m² (when 100 % white signal is input)
Panel drive		RGB 10 bit	RGB 10 bit	RGB 10 bit
Panel frame rate		96/100/120 Hz	96/100/120 Hz	96/100/120 Hz
Viewing angle		85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)
INPUT/OUTPUT				
Video Input/Output		Four (4) slots	Four (4) slots	Four (4) slots
PC Input		DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)
HDMI		HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)
Control	LAN	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)
	Parallel Remote	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)
	Option A	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)
	Option B	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)
DC 5V Out		Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)
GENERAL				
Power Requirements		100 V to 240 V AC, 1.9 A to 0.8 A, 50/60 Hz	100 V to 240 V AC, 1.4 A to 0.6 A, 50/60 Hz	100 V to 240 V AC, 1.2 A to 0.5 A, 50/60 Hz, or DC 24 V to 28 V, 4.6 A to 4.0 A
Power consumption		Approx. 170 W (at maximum load) Approx. 90 W (with 1 x BKM-243HS)	Approx. 140 W (at maximum load) Approx. 80 W (with 1 x BKM-243HS)	Approx. 110 W (AC), Approx. 100 W (DC) (at maximum load) Approx. 90 W (AC), Approx. 80 W (DC) (with 1 x BKM-243HS)
Operating Temperature		0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity		0 % to 90 % (no condensation)	0 % to 90 % (no condensation)	0 % to 90 % (no condensation)
Operating Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa	700 hPa to 1060 hPa
Storage and Trans. Temperature		-20 °C to +60 °C (-4 °F to +140 °F)	-20 °C to +60 °C (-4 °F to +140 °F)	-20 °C to +60 °C (-4 °F to +140 °F)
Storage and Trans. Humidity		0 % to 90 %	0 % to 90 %	0 % to 90 %
Storage and Trans. Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa	700 hPa to 1060 hPa
Dimensions (W x H x D)		794.0 x 556.7 x 243.1 mm (31 3/8 x 22 x 9 5/8 inches)	565.5 x 435.2 x 243.1 mm (22 3/8 x 17 1/4 x 9 5/8 inches)	436 x 265.8 x 278.6 mm (17 1/4 x 10 1/2 x 11 inches)
Mass		Approx. 27 kg (59 lb 8 oz)	Approx. 16 kg (35 lb 4 oz)	Approx. 11 kg (24 lb 4 oz)
Supplied Accessories		AC power cord (1), AC plug holder (1), Bracket (1), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Bracket (1), Connection cable for color temperature probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Bracket (1), Connection cable for color temperature probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)

BKM-250TG

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital component signals Sampling frequency 3G-SDI: Y/Cb/Cr: 148.5 MHz/74.25 MHz/74.25 MHz, G/B/R: 148.5 MHz/148.5 MHz/148.5 MHz HD-SDI: Y/Cb/Cr: 74.25 MHz/37.125 MHz/37.125 MHz, SD-SDI: Y/Cb/Cr: 13.5 MHz/6.75 MHz/6.75 MHz
Monitor Out	BNC (x2), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	3G-SDI: 70 m (approx. 230 ft) max. (When using 5C-FB coaxial cables (Fujikura. Inc.) or equivalent.) HD-SDI: 100 m (approx. 328 ft) max. (When using 5C-FB coaxial cables (Fujikura. Inc.) or equivalent.) SD-SDI:200 m (approx. 656 ft) max. (When using 5C-2V coaxial cables (Fujikura. Inc.) or equivalent.)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Optimum temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-20 °C to +60 °C (-4 °F to 140 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 270 g (9.5 oz)
Supplied Accessories	Operating Instructions (1)

BKM-243HS

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: SD-SDI: Y/R-Y/B-Y: 13.5 MHz, HD-SDI: Y/Pb/Pr: 74.25 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	SD-SDI: 200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent) HD-SDI: 100 m (approx. 328 ft) max. (when using 5C-FB coaxial cables (Fujikura) or equivalent)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 2 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-20 °C to 40 °C (-4 °F to 140 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-227W

INPUT/OUTPUT	
Composite Input	BNC (x1), 1 Vp-p ± 3 dB sync negative
Y/C Input	Mini DIN 4-pin (x1) Y: 1 Vp-p ± 3 dB sync negative C: 0.286 Vp-p ± 3 dB (NTSC burst signal level), 0.3 Vp-p ± 3 dB (PAL, PAL-M burst signal level)
Monitor Out	BNC (x1), Loop-through, with 75 Ω automatic termination Mini DIN 4-pin (x1), Loop-through, with 75 Ω automatic termination
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 1.8 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 240 g (8 oz)
Supplied Accessories	Operating Instructions (1)

BKM-244CC

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: SD-SDI: Y/R-Y/B-Y: 13.5 MHz, HD-SDI: Y/Pb/Pr: 74.25 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	SD-SDI: 200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent) HD-SDI: 100 m (approx. 328 ft) max. (when using 5C-FB coaxial cables (Fujikura) or equivalent)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-229X

INPUT/OUTPUT	
BNC (x3)	RGB Input 0.7 Vp-p ± 3 dB (Sync on Green, 0.3 Vp-p sync negative) Component Input 0.7 Vp-p ± 3 dB
External Sync Input	BNC (x1), 0.3 to 4 Vp-p ± bipolarity ternary or negative polarity binary Mini DIN 4-pin (x1), Loop-through, with 75 Ω automatic termination
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-220D

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: Y/R-Y/B-Y: 13.5 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ±10 % Output impedance: 75 Ω unbalanced
Transmission Distance	200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent)
GENERAL	
Voltage	+5 V (supplied from the main unit)
Power Consumption	Approx. 1.5 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-16R

INPUT/OUTPUT	
LAN	10BASE-T/100BASE-TX connector: RJ-45 x 1
DC 5V/12V IN	Circle 4-pin (male) (x1)
GENERAL	
Power Requirements	DC IN: 5 V, 1.1 A (supplied by the connected monitor) DC IN: 12 V, 0.5 A (supplied by the connected AC adaptor) AC adaptor: AC IN: 100 to 240 V, 50/60 Hz, DC OUT: 12 V, 3 A
Current Consumption	5 V DC, 1.1 A/12 V DC, 0.5 A
Power Consumption	Approx. 6 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operating temprature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to + 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	424 x 58.8 x 174.9 mm (16 3/4 x 2 3/8 x 7 inches)
Mass	Approx. 2.1 kg (4 lb 10 oz)
Supplied Accessories	AC adaptor (1), AC power cord (parts number: 1-757-562-1x1 for USA and Canada, 1-575-131-8x for Europe) (1), Rack mount brackets (2), Rack mount attachment screws (4), Function labels (2), Operation manual (1)

Optional Accessories

BKM-16R
Monitor Control Unit

BKM-250TG
3G/HD/SD-SDI Input Adaptor

BKM-244CC
HD/SD-SDI Closed Caption Adaptor

BKM-243HS
HD-SDI/SD-SDI Input Adaptor

BKM-220D
SD-SDI 4:2:2 Input Adaptor

BKM-229X
Analog Component Adaptor

BKM-227W
NTSC/PAL Input Adaptor

BKM-23M
Protection Panel*
(for BVM-L231 and PVM-L2300)

BKM-37H
Controller Attachment Stand
(for BVM-L231 and PVM-L2300)
*Tilt Function

BKM-38H
Controller Attachment Stand
(for PVM-L2300)

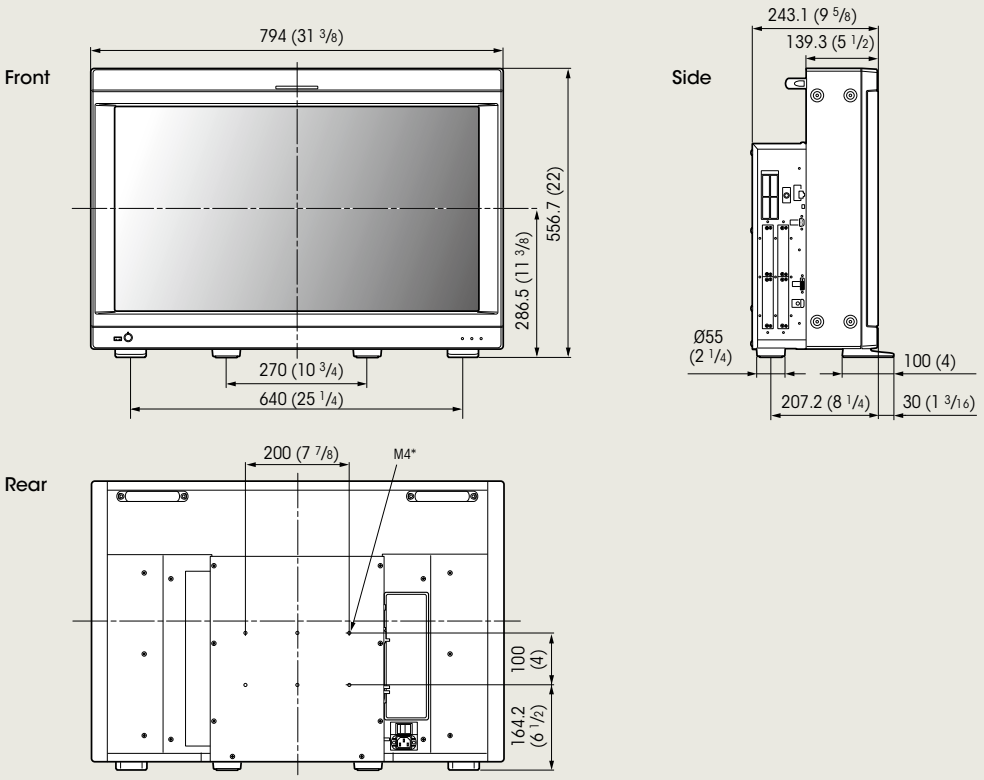
BKM-39H
Controller Attachment Stand
(for BVM-L170 and PVM-L1700)

SMF-700
Monitor Interface Cable

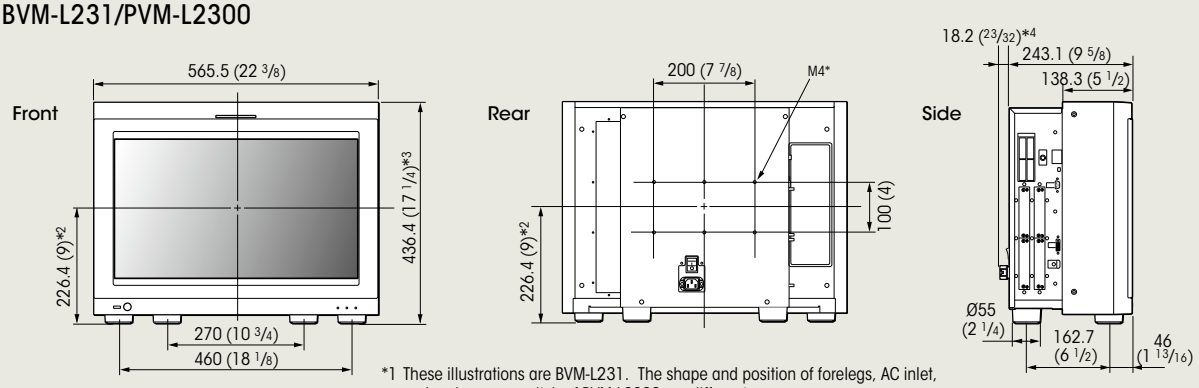
*BVM-L170, PVM-L3200, and PVM-L1700 equipped with a standard protection panel.

Dimensions

PVM-L3200



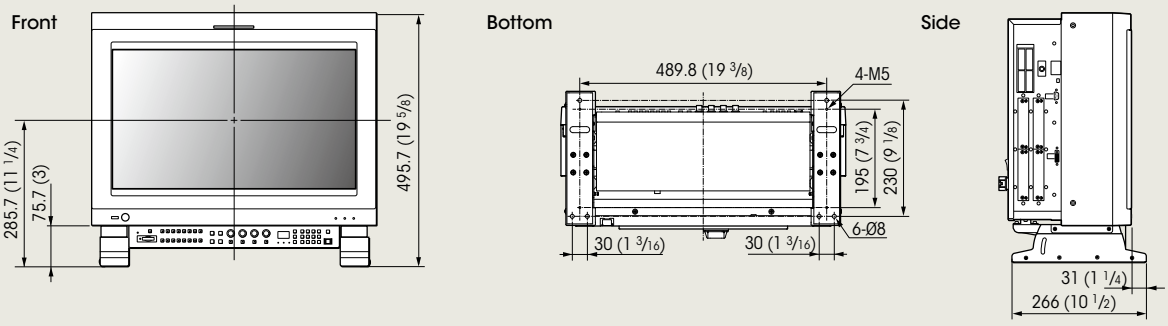
BVM-L231/PVM-L2300



*1 These illustrations are BVM-L231. The shape and position of forelegs, AC inlet, and main power switch of PVM-L2300 are different.

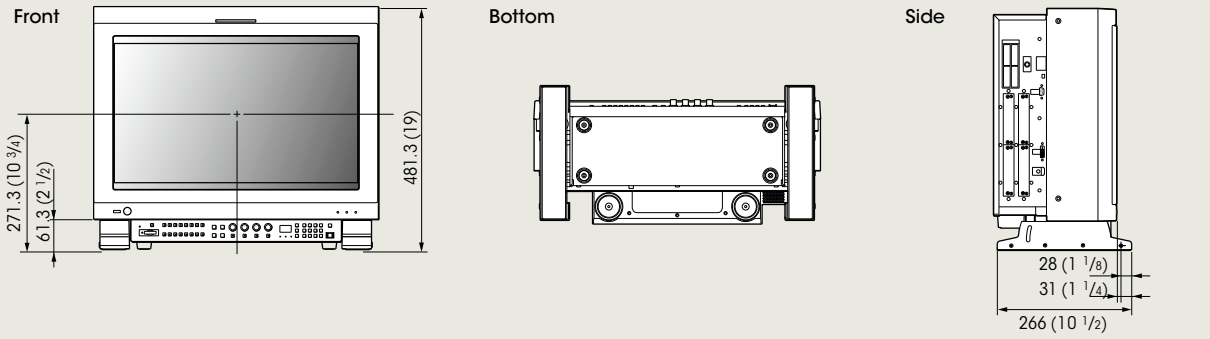
*2 PVM-L2300: 225.2 (8 7/8) *3 PVM-L2300: 435.2 (17 1/4) *4 BVM-L231 only has this part.

BVM-L231 with the optional BKM-16R and BKM-37H with a tilt.

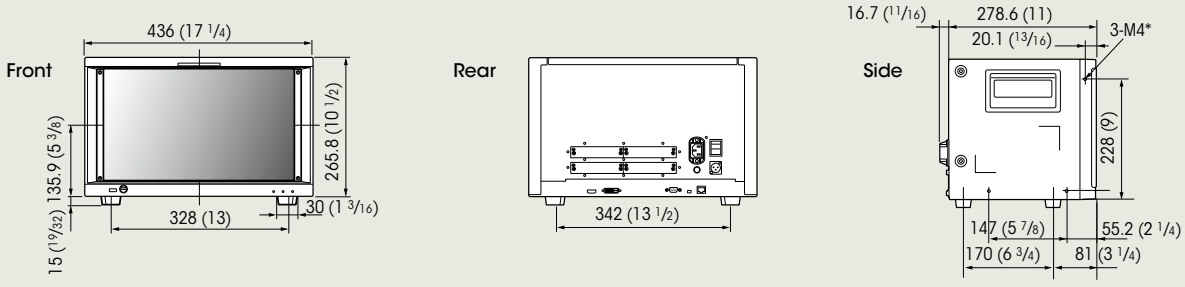


Unit : mm(inch)

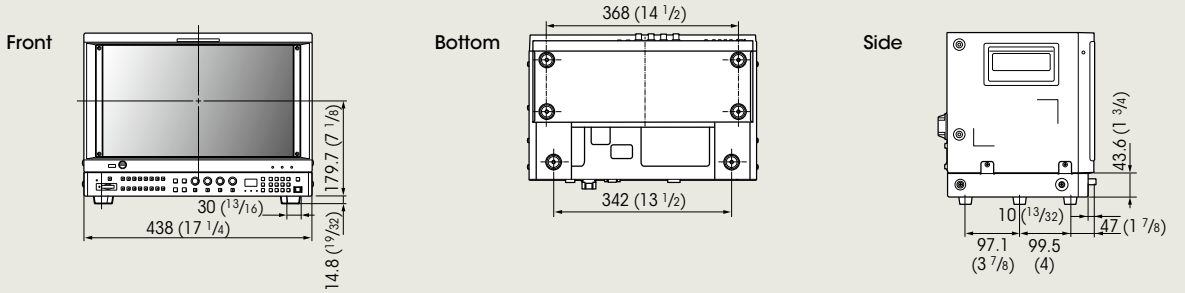
PVM-L2300 with the optional BKM-16R and BKM-38H



BVM-L170/PVM-L1700

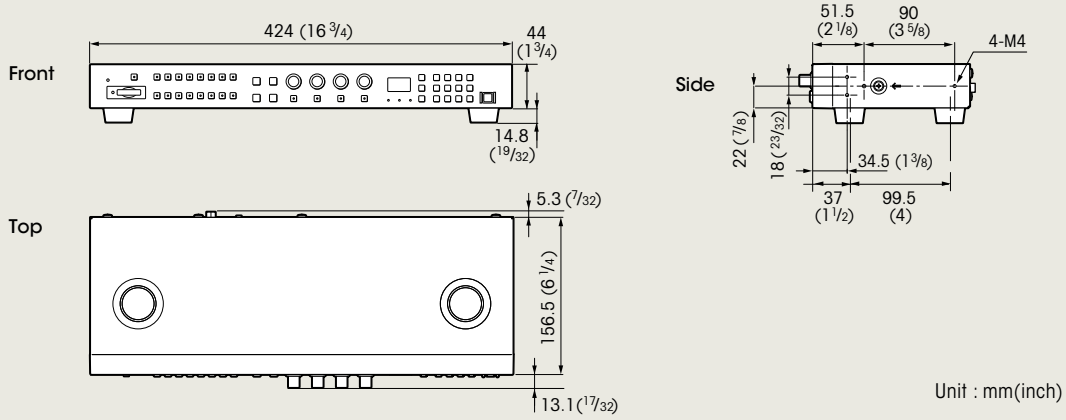


BVM-L170/PVM-L1700 with an optional BKM-16R and BKM-39H



Unit : mm(inch)

BVM-16R



Unit : mm(inch)

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